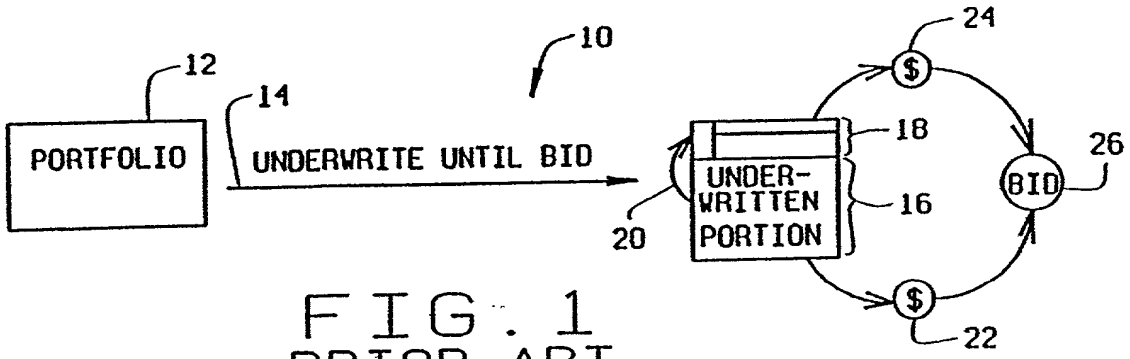


FIG. 1
PRIOR ART

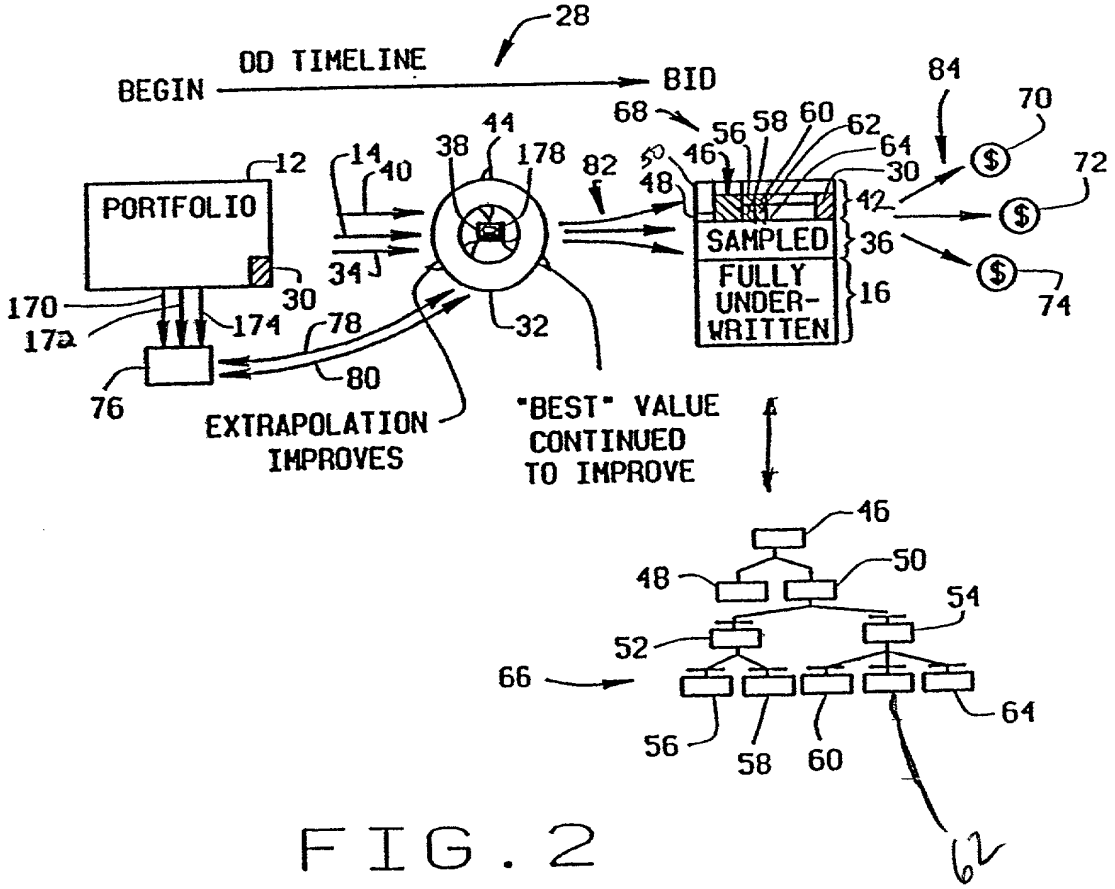


FIG. 2

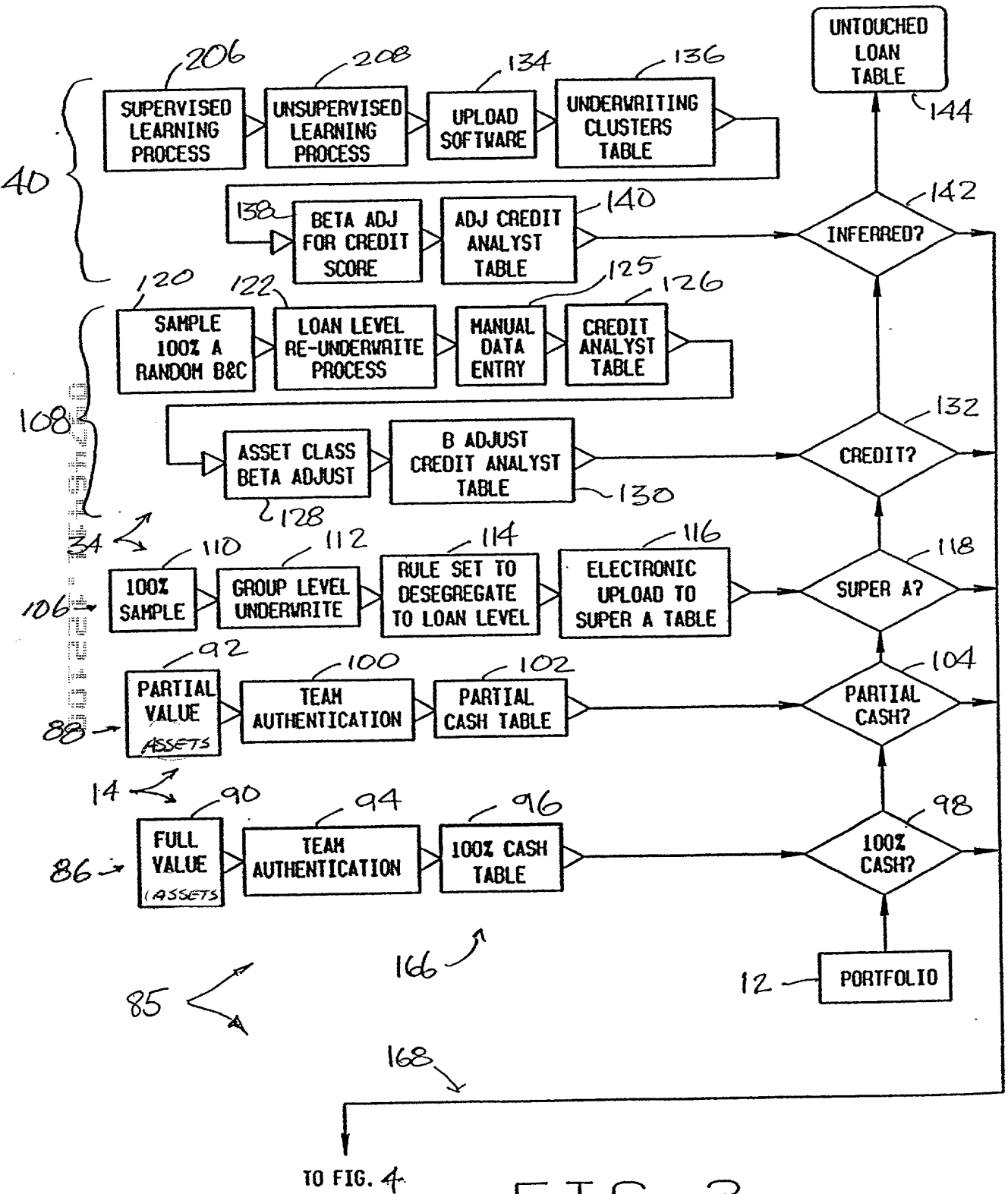

UNTOUCHED LOAN TABLE
144
206
208
134
136
SUPERVISED LEARNING PROCESS
UNSUPERVISED LEARNING PROCESS
UPLOAD SOFTWARE
UNDERWRITING CLUSTERS TABLE
40
138
BETA ADJ FOR CREDIT SCORE
ADJ CREDIT ANALYST TABLE
140
142
INFERRED?
120
122
125
126
SAMPLE 100% A RANDOM B&C
LOAN LEVEL RE-UNDERWRITE PROCESS
MANUAL DATA ENTRY
CREDIT ANALYST TABLE
108
132
ASSET CLASS BETA ADJUST
B ADJUST CREDIT ANALYST TABLE
CREDIT?
128
130
34
110
112
114
116
118
100% SAMPLE
GROUP LEVEL UNDERWRITE
RULE SET TO DESEGREGATE TO LOAN LEVEL
ELECTRONIC UPLOAD TO SUPER A TABLE
SUPER A?
106
92
100
102
104
PARTIAL VALUE ASSETS
TEAM AUTHENTICATION
PARTIAL CASH TABLE
PARTIAL CASH?
88
14
90
94
96
98
FULL VALUE (ASSETS
TEAM AUTHENTICATION
100% CASH TABLE
100% CASH?
86
16
12
PORTFOLIO
85
168
TO FIG. 4

FIG. 3

FROM FIG. 3

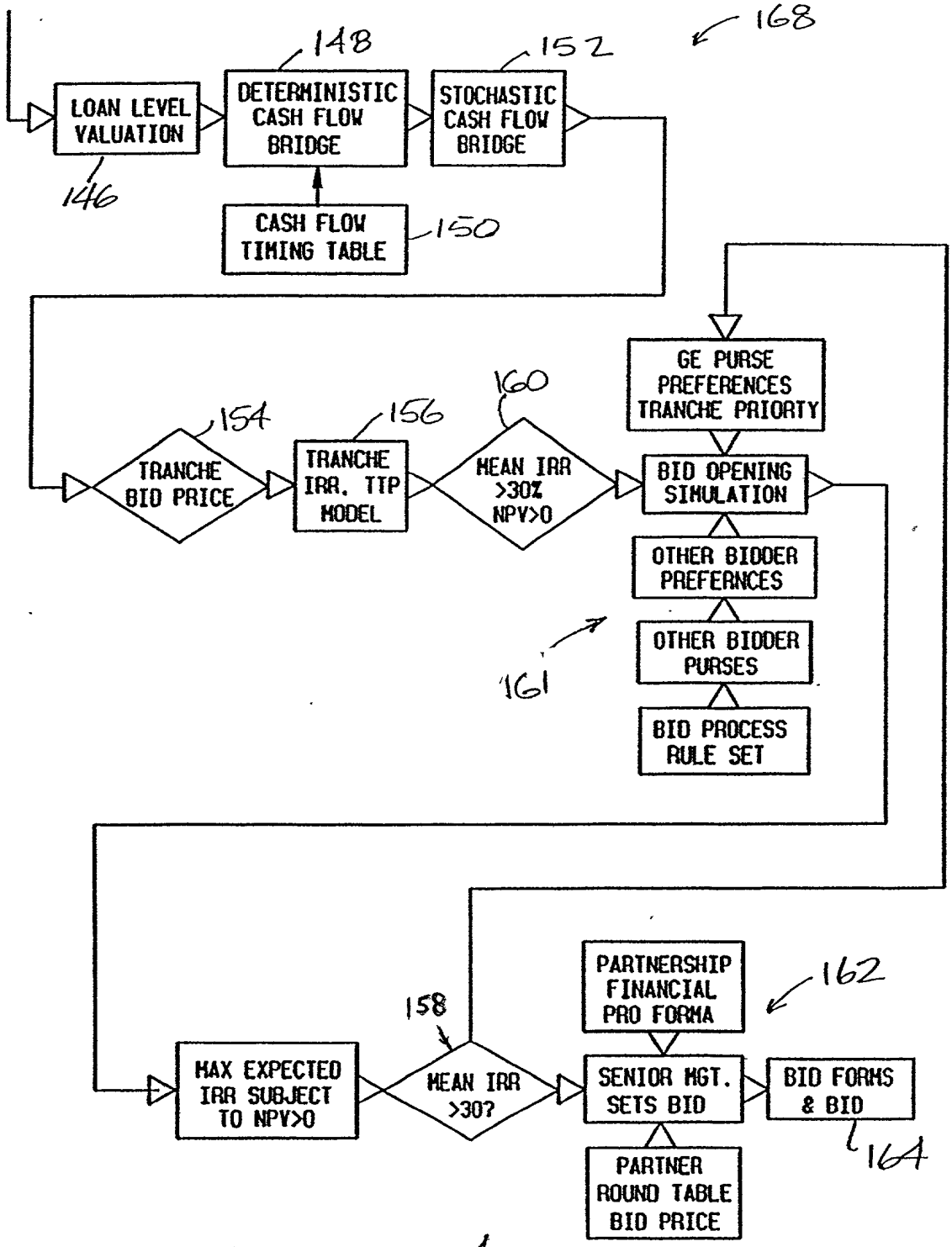


FIG. 4

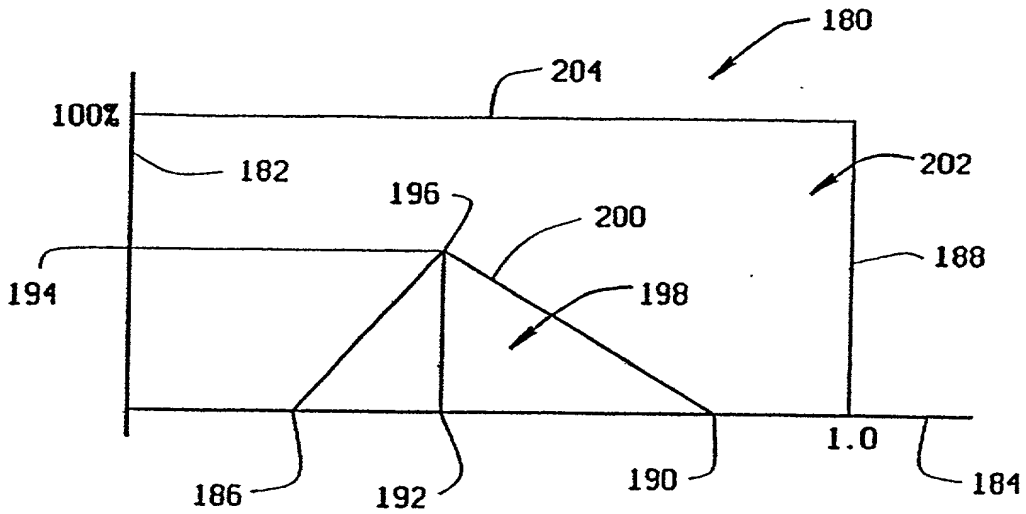


FIG. 5

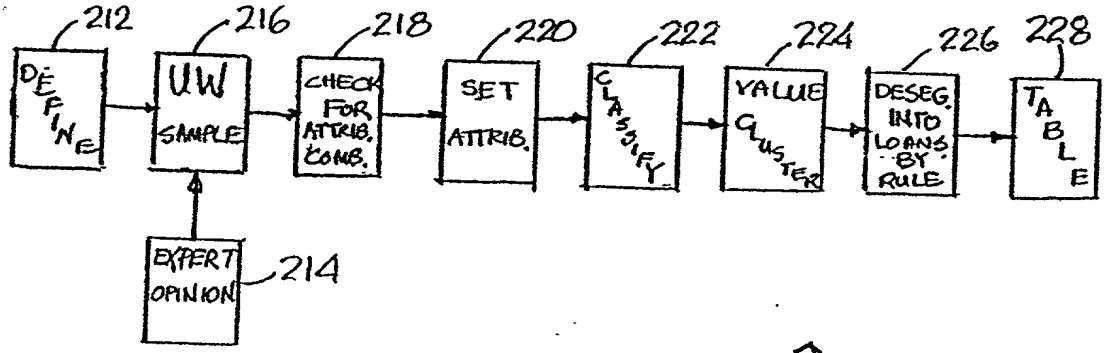


FIG. 6 210

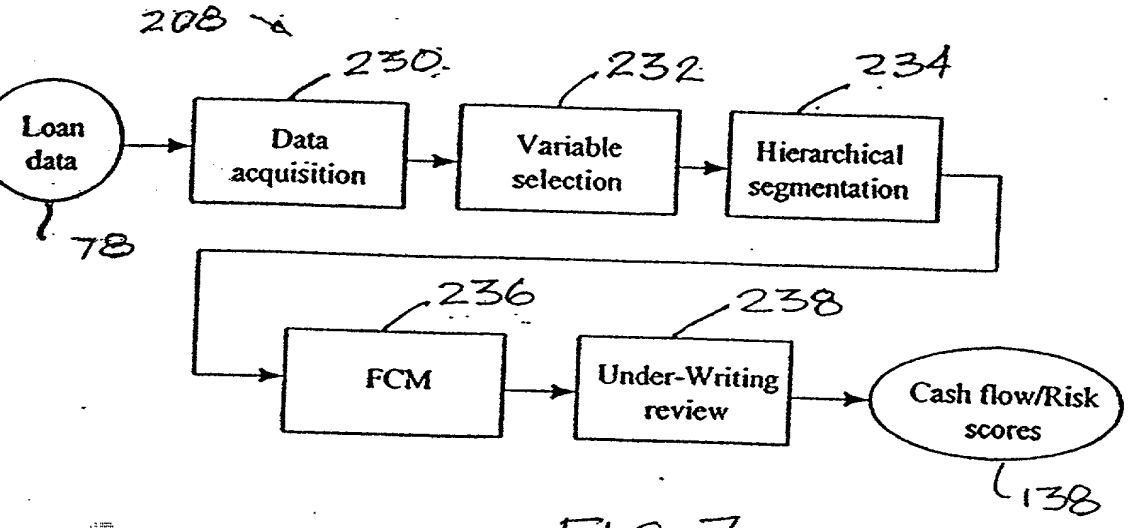

208
230
232
234
Loan data
Data acquisition
Variable selection
Hierarchical segmentation
78
236
238
FCM
Under-Writing review
Cash flow/Risk scores
138

FIG. 7

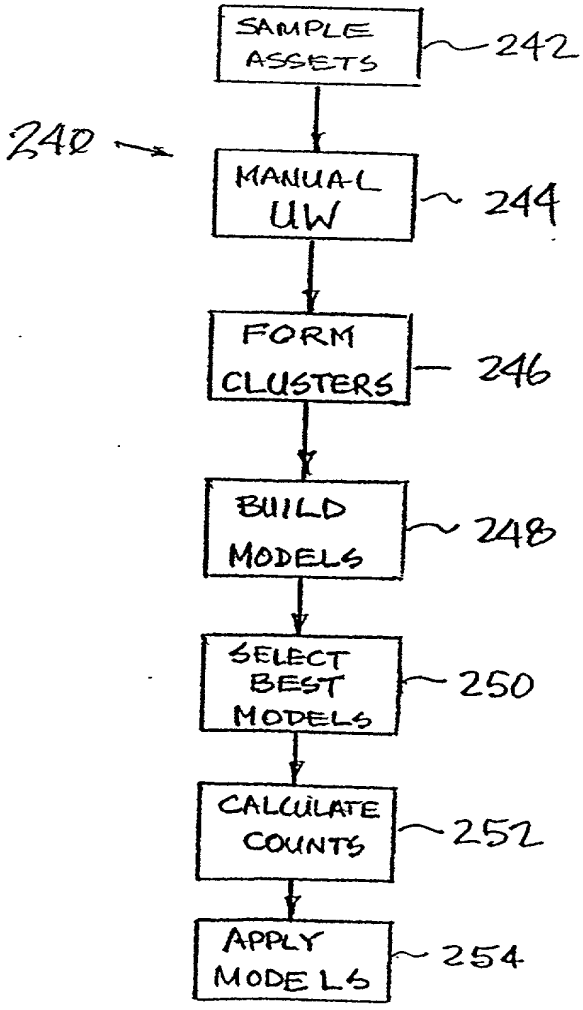

SAMPLE ASSETS
242
240
MANUAL UW
244
FORM CLUSTERS
246
BUILD MODELS
248
SELECT BEST MODELS
250
CALCULATE COUNTS
252
APPLY MODELS
254

FIG. 8

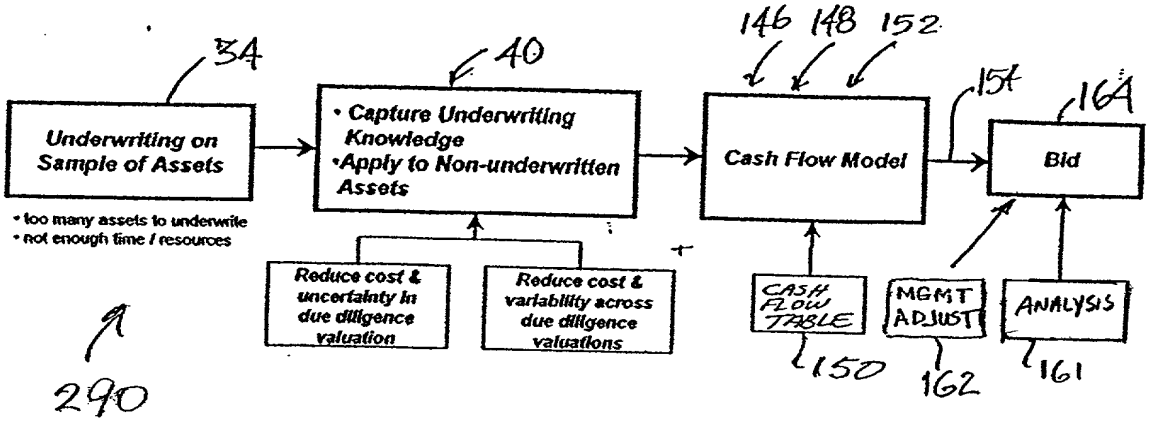

34
40
146
148
152
154
164
Underwriting on Sample of Assets
• too many assets to underwrite
• not enough time / resources
• Capture Underwriting Knowledge
•Apply to Non-underwritten Assets
Cash Flow Model
Bid
Reduce cost & uncertainty in due diligence valuation
Reduce cost & variability across due diligence valuations
CASH FLOW TABLE
MGMT ADJUST
ANALYSIS
150
162
161
290

FIG. 9

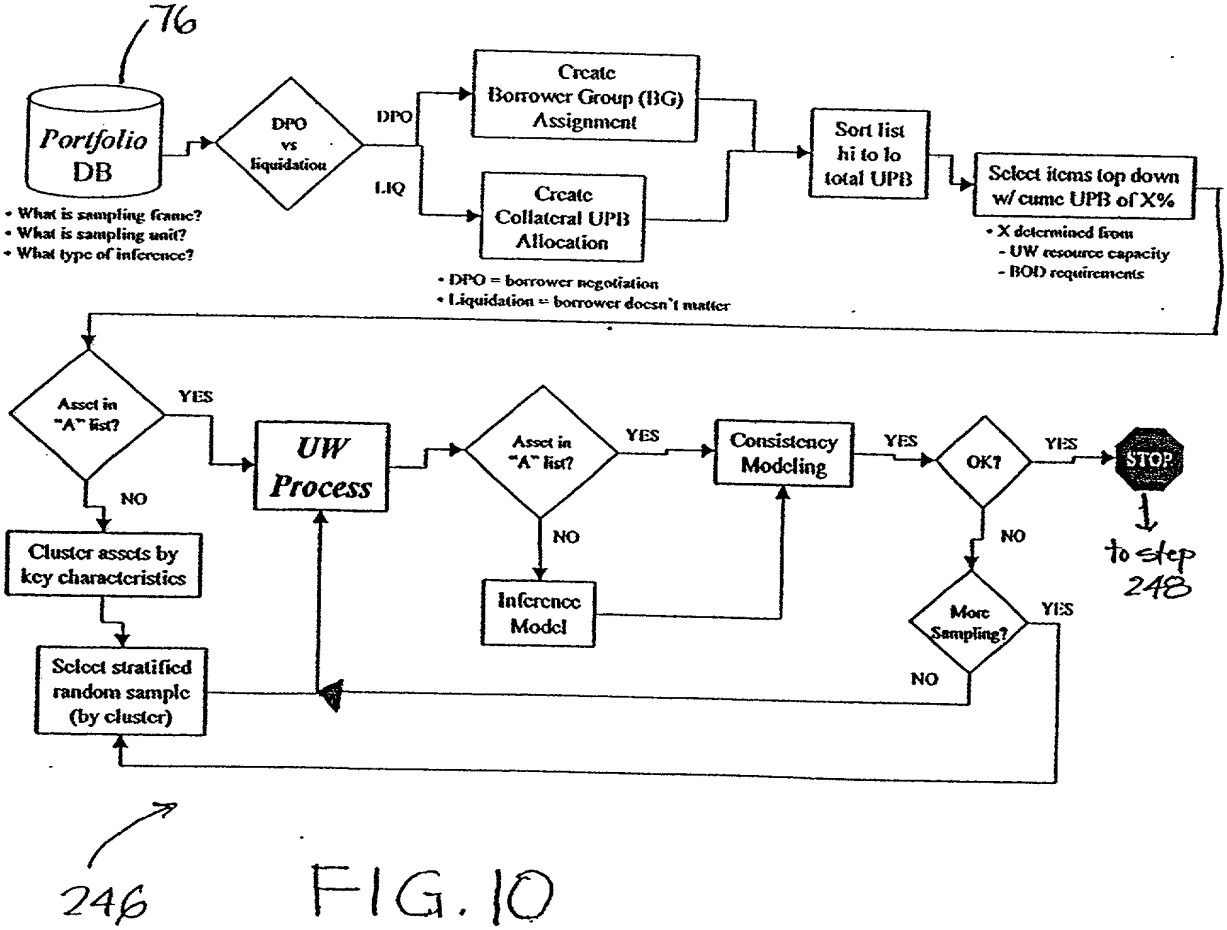
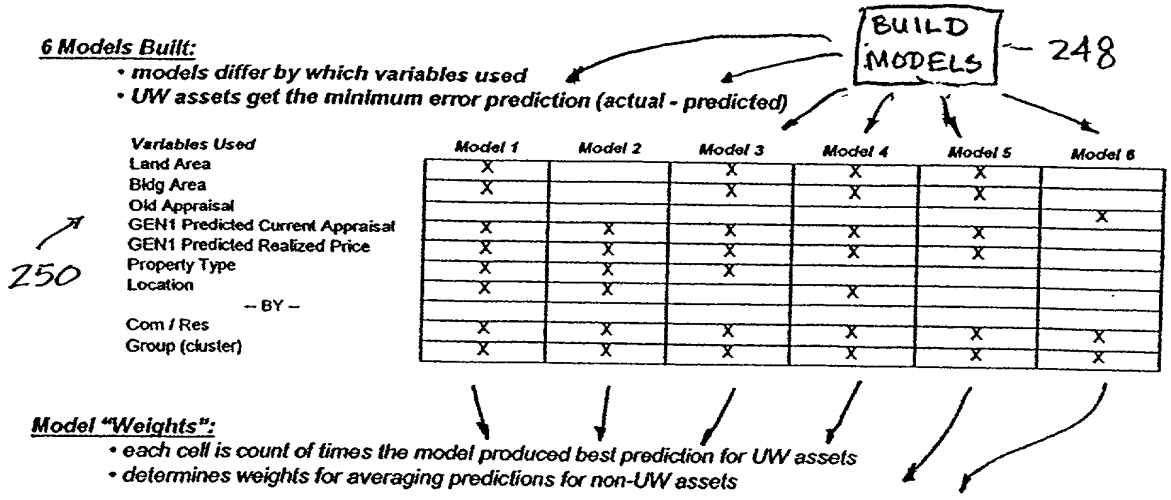

76
Portfolio DB
• What is sampling frame?
• What is sampling unit?
• What type of inference?
DPO vs liquidation
DPO
LIQ
Create Borrower Group (BG) Assignment
Create Collateral UPB Allocation
• DPO = borrower negotiation
• Liquidation = borrower doesn't matter
Sort list hi to lo total UPB
Select items top down w/ cume UPB of X%
• X determined from
- UW resource capacity
- BOD requirements
Asset in "A" list?
YES
NO
UW Process
Asset in "A" list?
YES
NO
Consistency Modeling
YES
OK?
YES
NO
STOP
to step 248
Cluster assets by key characteristics
Inference Model
More Sampling?
YES
NO
Select stratified random sample (by cluster)
246

FIG. 10



Model "Weights":

- *each cell is count of times the model produced best prediction for UW assets*
- *determines weights for averaging predictions for non-UW assets*

Model	Asset Class	Group	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Sum
Court Auction	Commercial	1	13	13	13	8	8	32	87
		2	29	25	29	24	22	19	148
	Total								235
Court Auction	Residential	1	5	5	10	15	4	12	51
		2	4	7	9	3	13	23	59
		3	2	15	11	4	13	8	53
	Total								163
Market Value	Commercial	1	16	13	11	10	15	21	86
		2	29	22	29	27	24	19	150
	Total								236
Market Value	Residential	1	5	8	4	9	11	14	51
		2	8	8	10	0	15	18	59
		3	6	16	5	5	20	2	54
	Total								164

256

258

252

FIG. 11

Variable	Category/Value Range	Encoding Scheme
Loan secured	{Yes, No}	Yes = 1 else 0
Loan type	{Revolving, Non-revolving}	Revolving = 1 else 0
Last payment	[0, 250 MM]	0 if Last payment = 0 else 1
Notice of default sent		Prior to Jun 97 equals 1 else 0
Original maturity date		Prior to Jun 97 equals 1 else 0
Syndicated Loan	{Yes, No}	Yes = 1 else 0
Loan guaranteed	{Yes, No, NAV}	Yes = 1 else 0
Collection score	[0, 1]	
Lien position	{-1, 0, 1}	1 if Lien position = 1 else 0
Current unpaid balance/Original balance	[0, 2.9]	Normalized to [0, 1]
Last payment to Interest/Last payment	[0, 1]	

80

FIG. 12

138

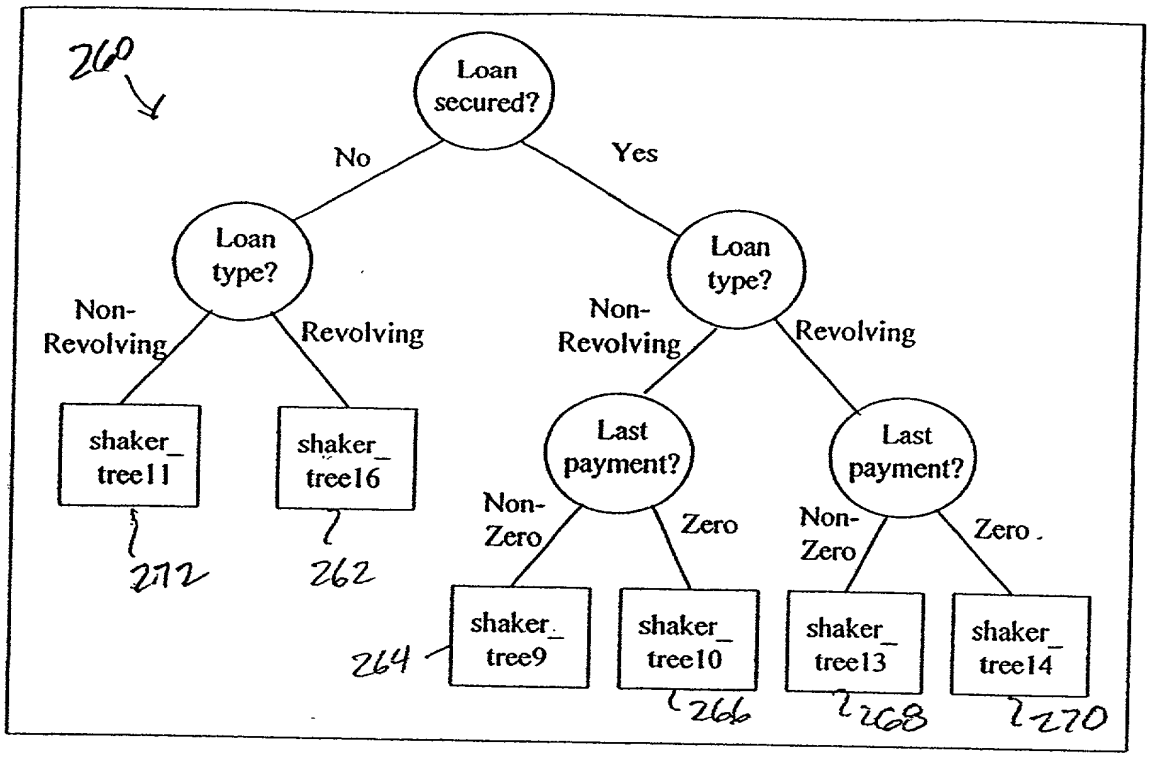
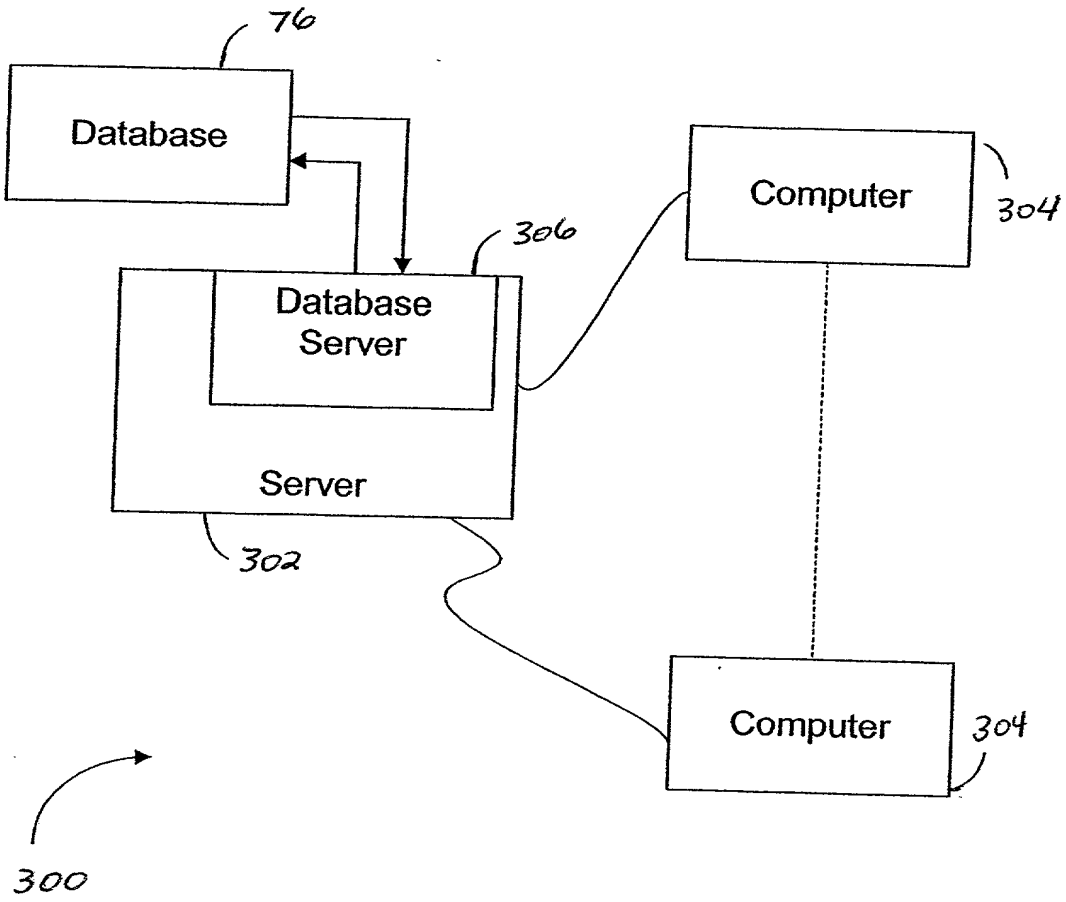

260
Loan secured?
No
Yes
Loan type?
Loan type?
Non-Revolving
Revolving
Non-Revolving
Revolving
shaker_ tree11
shaker_ tree16
Last payment?
Last payment?
Non-Zero
Zero
Non-Zero
Zero
shaker_ tree9
shaker_ tree10
shaker_ tree13
shaker_ tree14
272
262
264
266
268
270

FIG. 13

Figure 14



DOCKET ALARM